

## **REMARKS**

Claims 1-26 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejection(s) in view of the amendments and remarks contained herein.

### **REJECTION UNDER 35 U.S.C. § 102**

Claims 1, 4-6, 9, 12-14, 17-21 and 24-26 stand rejected under 35 U.S.C. § 102(e) as being unpatentable by Kataoka et al. ('632). This rejection is respectfully traversed.

Applicant's claims 1, 9, and 17 have been amended to include a hybrid electric vehicle with a variable displacement internal combustion engine. Claims 1, 9 and dependent claims of claim 17 have been amended to define an activated mode as when the engine is operating with all cylinders active and a deactivated mode as when the engine is operating with less than all cylinders active. At a minimum, Katoaka does not disclose a variable displacement engine that transitions to or operates in a deactivated mode where the engine is operating with less than all cylinders active.

Displacement is defined as the total volume of air/fuel mixture an engine draws in during one complete engine cycle. Variable displacement is an automobile engine technology that allows the engine displacement to change for improved fuel economy. Typically variable displacement systems work by turning off one bank of cylinders in a V type engine, but more generally can vary the displacement of the engine by turning on and off any number of cylinders during engine operation. The cylinders are considered turned off when fuel and ignition are not commanded to the cylinder. Displacement on

demand as referred to in Applicant's specification is a trademarked name for the variable displacement technology provided by General Motors. The trademark displacement on demand in claims 1, 9 and 17 has been replaced with the generic term variable displacement. Kataoka does not disclose a variable displacement engine that performs variable displacement transitions.

More specifically, Kataoka does not disclose transitioning the engine from an activated mode to a deactivated mode where the engine is operating with less than all cylinders active. Furthermore, Katoaka does not disclose operating an engine in a deactivated mode where less than all cylinders are active. At best, Kataoka discloses transitioning the engine from a normal running mode to a stop mode. While in the stop mode, the engine is automatically stopped at the time the vehicle stops. (Column 11, lines 53-55) As shown in Figures 7 -10 of Katoaka, fuel is cut and ignition is cut to all cylinders while the engine is in the stopped mode (after the actual stop position indicated in the Figures). Therefore, Katoaka's engine is not operating in the stopped mode. The engine may still rotate for a short period of time due to momentum but the engine is not operating.

The Examiner suggests that Figures 7-10 suggest displacing cylinders on demand when needed for fuel consumption. Cylinders are not displaced per se, but engine displacement can be varied in variable displacement engines. Even so, Figures 7-10 do not disclose operating the engine with less than all cylinders active to vary the displacement. Figures 7 and 9 are directed to control methods for stopping the engine or transitioning from the normal running mode to the stopped mode. During this transition event, all of the cylinders in Figures 7 and 9 are active either by an ignition

event or a firing event. Once the transition event is over, all cylinders are inactive and the engine is not operating. Therefore, Katoaka's engine even in a transition mode does not operate with less than all cylinders active thereby varying the engine displacement.

Tatara also does not disclose a variable displacement internal combustion engine, transitioning the engine from an activated mode to a deactivated mode where the engine is operating with less than all cylinders active, and operating an engine in a deactivated mode where less than all cylinders are active. At best, Tatara teaches an engine capable of operating in two cruise modes (1) a motor cruise mode (in which the vehicle is driven by the motor-generator) and (2) an engine cruise mode (in which the vehicle is driven by the engine) (Paragraph 57). Tatara teaches providing an all-cylinder deactivation command to the engine to stop fuel injection and ignition to all cylinders (Paragraph 54). The all-cylinder deactivation command allows the engine to transition from the engine cruise mode to the motor cruise mode. Tatara does not teach an engine capable of operating with less than all cylinders active. Tatara does not teach transitioning from an activated mode to a deactivated mode where the engine is still operative in a deactivated mode. Therefore, Tatara does not teach a variable displacement engine capable of operating in a deactivated mode similar to Applicant's invention.

Claims 4-6, 12-14 and 18-21 depend on one of independent claims 1 and 9 and for the reasons set forth above, distinguish over the cited art. Accordingly, Katoaka and Tatara fail to teach every element of claims 1, 4-6, 9, 10, 13, 14, 17-21, and 24-26.

Therefore Applicant respectfully requests reconsideration and withdrawal of the rejection.

#### **REJECTION UNDER 35 U.S.C. § 103**

Claims 24 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tatara et al. ('877) in view of Kataoka et al. This rejection is respectfully traversed.

Claims 24 and 25 are dependent on claim 17 and for the reasons set forth above, distinguish over the cited art. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection.

#### **ALLOWABLE SUBJECT MATTER**

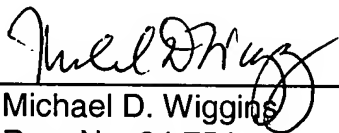
The Examiner states that claims 2, 3, 7, 8, 10, 11, 15, 16, 22 and 23 would be allowable if rewritten in independent form. Applicant reserves the right to rewrite any or all of claims 2, 3, 7, 8, 10, 11, 15, 16, 22 and 23 at a later date as needed.

## CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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